

Improving smartphone follow-up after patient discharge from annual short-term head and neck missions in Ethiopia

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Summary

A lack of reliable, long-term patient follow-up data after discharge from short-term surgical missions to low-income and middle-income countries remains a key issue in global humanitarian work. Project Harar is a non-governmental organisation that works in close association with surgeons from the Yekatit 12 Medical College, Addis Ababa, to treat children and adults with complex facial disfigurement in Ethiopia on an annual head and neck and facial reconstructive mission. Following a successful pilot study employing charity field workers and smart phones to follow-up patients in 2018 and 2019, Project Harar now uses patients' own smartphones to achieve follow-up remotely, without the need for field workers in the majority of cases. Using patient smartphones, triage safety questions and post-operative photographs can be relayed directly to the charity post-operatively. Using this follow-up model, the majority of patients from the 2020 complex reconstructive mission were successfully followed-up. We present data in support of our new method of remote triage and follow-up, and detail a comprehensive algorithm for remote follow-up using patients' own smartphones after discharge from a short-term reconstructive missions in Ethiopia. We hope this work will be beneficial for similar organisations operating in resource-limited settings around the world facing challenges in reliable patient follow-up.

Keywords

Short-term surgical mission; Follow-up; Remote follow-up; Low-income and middle-income country; Head and neck reconstruction

Introduction

Project Harar is a non-governmental organisation (NGO) that works closely with Yekatit 12 Medical College, Addis Ababa, Ethiopia, treating children and adults with complex facial disfigurement on annual short-term reconstructive missions. Contrary to our recent 2020 mission comprising 35 volunteers, early Project Harar missions were significantly less well resourced. As a result, patient follow-up was often limited to less than one month.¹ Today, there is still a global lack of longer-term follow-up reported after short-term reconstructive missions.²

In 2017, a Project Harar review team travelled across Ethiopia gathering long-term outcome data for patients operated on by the charity since 2008. Although successful, the time commitment, extensive distances travelled, and associated costs were limiting factors for the sustainability of this follow-up method.³

In 2018, the charity piloted remote follow-up using regional field workers with smartphones to follow-up 79% of patients in their rural villages at ten months post-operatively. Project Harar has continued to develop and refine this novel method using smartphones, minimising costs for the charity and the burden on patients after discharge.⁴

The aim of this study is to evaluate the transition from successful pilot follow-up programme into routine charity practice, and to evaluate the quality of remote follow-up data being received. Based on this we propose a new educational tool and a follow-up algorithm that will benefit other NGOs working in resource-limited settings.

Patients and Methods

Three months after discharge from the 2020 mission, patients were contacted via telephone (voice or video call) using the IMO app (a communications app) and asked six triage questions, as previously detailed by the authors.⁴

Patients were asked to send photographs to Project Harar using their own smartphones (anteroposterior, lateral, oblique, and (if indicated) intra-oral views). All consented to their photographs and clinical data being used. De-identified patient data was sent to the charity leads via a secure file-sharing platform. Four consultant head and neck surgeons graded all photos using a visual analogue scale, from 1 (poor quality and diagnostic utility) to 5 (excellent quality and diagnostic utility).

Results

Twenty-six patients were operated on during the 2020 mission (mean age 23.3 years, range 4 to 40). Twenty-three [88%] of 26 patients provided answers to the triage questions, and photographs were received from 19 [73%] of 26 patients. Three patients were not contactable. Four patients had no internet access to send photographs. Twenty-two [96%] of 23 patients were happy with their surgical outcome at three months.

Photo quality assessment

Five photos [4%] were graded 1 (poor), 18 [14%] graded 2, 46 [36%] graded 3, 54 [42%] graded 4, and 5 [4%] graded 5 (excellent). Reasons for low grading included: poor focus, poor resolution, and incorrect patient angle or position.

Discussion

Follow-up and triage using patients' own smartphones is now established charity practice, enabling successful follow-up of the majority of patients following a short-term head and neck reconstructive mission in Ethiopia. In 2020 our follow-up rate improved from 79 % (2018-2019) to 88 %, without field workers having to travel to patients' home regions in the majority, allowing the re-allocation of charity workforce whilst ensuring continued patient safety. Regional travel restrictions due to the COVID-19 pandemic, and recent civil unrest in Ethiopia, have so far been overcome using our remote follow-up method. However, major disruptions affecting smartphone networks and internet coverage could be detrimental to the remote follow-up model, leading to time delays. Face-to-face follow-up using field workers will remain an essential element for any uncontactable patients, those unable to send follow-up photographs, and those retuning for staged surgery.

The photograph grading data indicated that patient photograph quality was highly variable- although, in most cases sufficient to assess post-operative complications and early outcomes. Suboptimal photographs were often simply due to patient positioning. We created a medical picture guideline (Figure 1) as an educational tool to assist patients to take better quality, standardised, post-operative photographs.

Future developments

Ongoing refinements in patient follow-up practice have led to the development and implementation of a new remote follow-up algorithm (Figure 2). During the next mission, patients' will be assessed taking photographs prior to discharge, and education provided in conjunction with the medical picture guideline (Figure 1). We aim to expand our programme to include pre- and post-operative mouth-opening and eating videos for patients with

relevant pathology (e.g. temporomandibular joint (TMJ) ankylosis). In addition, physiotherapy using smartphones for TMJ cases may also be possible, but further work is required.

Conclusions

Patients' smartphones alone facilitated successful follow-up in the majority of patients following a short-term reconstructive head and neck mission in Ethiopia, reducing burden and travel time for patients, and saving significant cost and workload for the charity. In an effort to improve accountability on short-term surgical missions, we hope this work will be of use to other organisations operating in resource-limited settings facing access restrictions limiting longer-term patient follow-up.

Funding

None

Declaration of competing interests

None

Disclosures

None

Ethical approval

This study is part of an ongoing audit of clinical practice and did not require research and ethics approval.

Patient consent

Written patient consent was obtained from all patients included in this study.

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FIGURES AND LEGENDS

Figure 1. Medical Picture Guideline: An educational tool to assist patients in providing optimal quality post-operative photographs, aiding complication identification. In practice, the medical picture guideline will be translated appropriately depending on each patient's language/dialect.



Figure 2. Remote follow-up Algorithm: An algorithm to support successful remote follow-up using patients' own smartphones.

